ABSTRACT TEMPLATE for Company Presentations

Questions for categories: Biotech

Milk has evolved throughout the evolution of mammals to provide nourishment and to enhance and improve the physical, immunological, metabolic and even cognitive development of the young. To meet these goals, the evolution of lactation and milk resulted in a suit of unique structures and compositions of the milk solids; fat, sugars and proteins. Macrostructures enable the transport of minerals, vitamins and building blocks for tissues in the most efficient way, increasing the bioavailability of milk components. Moreover, milk's unique structure plays a role in influencing the gut functionality and the immune system.
From all milk constituents, fat has been the least studied component. Milk fat is secreted as an assembly of fat and proteins, derived from the mammary gland milk secreting cells. The structure is unique in terms of its envelope that consists of a trilayer of polar lipids, and was always considered an merely emulsifier of milk fat. However, over the last decade, evidence for its role in immunomodulation, metabolism and even prebiotics properties provided clear indication for the health promoting role of this structure.
One of the unique properties of the milk fat is its size diversity. In every given moment milk fat is secreted as globules with a diameter ranging from the nanometer length scale to over 15 micrometers. We aimed to use this size diversity to enhance the production of small size milk fat globules, known to be richer in the polar lipid envelope of milk, hence improving milk bioactive properties. The mechanisms which control milk fat droplet size was thoroughly studied, using molecular, biochemical and physical approaches. Moreover, the effect of size on the consumer, and commensal bacteria strains were determined, elucidating new health and metabolic roles for the size of the milk fat globule.